Meeting Minutes Transmittal/Approval
Unit Managers' Meeting
200 Area Groundwater and Source Operable Units
3350 George Washington Way, Richland, Washington
April 2000

APPROVAL: _____ Date 8/10/00
Bryan Foley, 200 Area Unit Manager, RL (A5-13)

APPROVAL: N. P. Date _____
Wayne Soper, 200 Area Unit Manager, Ecology (B5-18)

APPROVAL: _____ Date 9-5-00
Dennis Faulk, 200 Area Unit Manager, EPA (B5-01)

APPROVAL: Arlene C. Tortoso Date 8/14/00
Arlene Tortoso, Groundwater Unit Manager, RL (H0-12)

Meeting minutes are attached. Minutes are comprised of the following:

Attachment 1	--	Agenda
Attachment 2	--	Attendance Record
Attachment 3	--	200 Area UMM Minutes – April 2000
Attachment 4	--	Map of 200-ZP-1 Compliance Wells
Attachment 5	--	Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites FY 1997 – FY 2000
Attachment 6	--	Results of 200-CW-1 Drum Sampling for Hydrazine
Attachment 7	--	Approval of the 200-ZP-2 Monitoring Plan for FY 2000

Prepared by: _____ Date 4/22/00
Chloe Brewster (HO-19)

Concurrence by: _____ Date 6/19/00
Bruce Ford, BHI Groundwater/Vadose Zone Integration (H0-19)

Attachment 1

UNIT MANAGERS' MEETING AGENDA

3350 George Washington Way
April 27, 2000

9:00 – 11:00 a.m. 200 Area Room 1B40

- 200-UP-1 (5 minutes)
  - Status Operational Update

- 200-ZP-1 (10 minutes)
  - Status Operational Update
  - Summary of Flooding Event
  - Clarification of Waste Handling

- 200-ZP-2 (20 minutes)
  - Status PITT
  - Approval of Monitoring Plan for FY2000
  - Clarification of Waste Handling

- 200-CW-1 Gable/B Pond and Ditches Cooling Water OU (30 minutes)
  - Work Plan Status
  - Status on Contained-in Determination
  - Hydrazine Sampling of IDW
  - Remedial Investigation Report
  - Data Evaluation Logic/Process
  - Draft A submittal 8/15/00; Regulator Review 8/16-9/15, 2000

- 200-CS-1 Chemical Sewer OU (5 minutes)
  - Work Plan Status

- 200-CW-5 U Pond/Z Ditches Cooling Water OU (5 minutes)
  - Work Plan Status
  - Schedule EPA comment disposition meeting
- 200-TW-1 Scavenged and 200-TW-2 OUs (5 minutes)
  - DQO Status
  - Regulator DQO Workbook review meeting – 4/27/00
  - Work Plan Status
  - Draft A submittal 8/18/00; Regulator Review 8/21-9/20, 2000
- FY2001-2003 Detailed Work Planning (5 minutes)
  - Annual relook at OU prioritization
  - Realignment with RL's focus on Hanford Outcomes
  - Schedule Review

082092

200 Area Unit Mangers' Meeting
April 27, 2000
9:00 a.m. – 11:00 a.m.
3350 George Washington Way, Conference Room 1B-40

ATTENDEE	ORGANIZATION	PHONE NUMBER
Dennis Faulk	EPA	376-8631
Zachary Faulk		
Bryan L. Foley	DOE-RL	376-7087
Timothy A. Lee	CHI	375-3444
Craig Swanson	CHI	372-9553
Virginia Rohay	CHI	372-9100
Arlene Tortoso	DOE	373-9631
George Ctheridge	CHI	372-9381
Garrett Day	BHI	372-9571
JOAN WOOLARD	BHI	372-9649
Mary E. Todd	CHI	372-9030
Curt Wittreich	CHI	372-9586

MEETING MINUTES
200 AREA GROUNDWATER AND SOURCE OPERABLE UNITS
UNIT MANAGERS' MEETING --200 AREA
April 27, 2000

Attendees: See Attachment #2

Agenda: See Attachment #1

Due to the absence of representatives from the Washington State Department of Ecology (Ecology), the 200-CS-1 Operable Unit (OU) and portions of the 200-CW-1 OU were not discussed.

Topics of Discussion:

1. 200-UP-1 – Operational status was provided by George Henckel, Bechtel Hanford, Inc. (BHI), in that it is still running. Waste going to the Effluent Treatment Facility (ETF) is dependent upon the other Hanford campaigns. The ETF can currently only accept water from 200-UP-1. When the receiving basin is full, pumping will be shut down.

2. 200-ZP-1 – Craig Swanson, CH2M HILL, Hanford, Inc. (CHI), provided a map of **200-ZP-1 Compliance Wells** and reported that well 699-51-63 was rusted and cannot be safely sampled. Therefore, a replacement well is needed. It was proposed to use well 699-55-60A for sampling; however, this well is not *Washington Administrative Code* compliant, even though it is in the flow path. Dennis Faulk, U.S. Environmental Protection Agency (EPA), prefers a well in the flow path be used. Well 699-55-60A will be added to the well network per approval from Dennis Faulk (EPA).

   George Henckel provided a summary of the flooding that occurred Thursday, April 20, 2000, inside the 200-ZP-1 treatment building with effluent water. Two tanks were manually shut off to stop the flooding. The water was pumped out and the building was allowed to air dry. After investigation, it was found that the root cause of the problem was loose wiring. There was no damage to electrical equipment and everything is currently working/running as normal. Arlene Tortoso, Department of Energy, Richland Operations Office (RL), requested that lessons learned be prepared and provided to her.

   A discussion on waste handling was initiated by Joan Woolard, BHI, who provided an agreement form to Dennis Faulk (EPA), George Henckel (BHI), and Arlene Tortoso (RL) to review and revise. Dennis Faulk (EPA) requested a list of all wells in use for both 200-ZP-1 and 200-ZP-2 OUs, including passive wells, with their locations mapped out. The list will be attached to the agreement form. Currently, there is no sampling or monitoring at any wells in these OUs. Dennis Faulk (EPA) provided his okay to bring OU-generated waste to the 90-day pad for temporary storage until a waste management plan is issued. The revised agreement form and list of wells will be provided to Dennis Faulk (EPA) on Friday, April 28, 2000, for his signature.

   A technical meeting was proposed for May 17, 2000, to discuss in detail the recommendations from the recently published performance report for the 200-ZP-1 and 200-ZP-2 OUs, as requested by Dennis Faulk (EPA).

3. 200-ZP-2 – The BHI cost estimate and list of assumptions regarding the Partitioning Interwell Tracer Test (PITT) technology is currently being prepared and will be provided to DOE and EPA by May 15, 2000. Duke will revise their estimate and provide it to BHI as part of the cost roll-up. A preliminary schedule will also be prepared and provided to EPA on May 15.

   The approval form and 200-ZP-2 monitoring plan for FY 2000 was provided to Dennis Faulk (EPA) for his signature. He agreed to review and sign the documents by Friday, April 28, 2000.

   Virginia Rohay, CHI, provided a handout on the **Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites FY 1997 – FY 2000**. Dennis Faulk questioned why the results at well W15-217 are significantly lower on 9/28/99 and 3/7/00. Virginia will check into this matter.

4. 200-CW-5 U Pond/Z Ditches Cooling Water OU – Bryan Foley (RL) reported that the extended EPA review of the work plan has lead to a significant project schedule variance. Dennis Faulk (EPA) suggested that the matter should be discussed with Doug Sherwood (EPA).

5. 200-TW-1 Scavenged and 200-TW-2 Tank Waste OUs – The regulator data quality objectives (DQO) workbook review meeting is scheduled for the afternoon of April 27, 2000. Ecology will not be attending.

   The schedule for the work plan shows submittal of the draft A to the regulators by August 18, 2000. The regulatory review period is August 21 through September 20, 2000.

6. FY 2001-2003 Detailed Work Planning – Bryan Foley (RL) reported that the annual relook at OU prioritization is in progress. New principles that align with RL's focus on Hanford Outcomes (i.e., stabilizing the Central Plateau) are influencing prioritization decisions. RL will be having discussions on this subject with EPA and Ecology.

   Between May 8 and May 25, there will be scope presentations to RL, regulators, and others. Another meeting will be held mid-June to finalize scope statements for FY01-03.

7. 200-CW-1 Gable/B Pond and Ditches Cooling Water OU – A handout was provided and reviewed on the **Results of 200-CW-1 Drum Sampling for Hydrazine**. All results show that hydrazine was not detected. A contained-in determination request letter is in preparation.

8. 200-CS-1 Chemical Sewer OU – This OU was not discussed.

Actions:

1. Prepare and provide lessons learned on the 200-ZP-1 treatment building flooding event to Arlene Tortoso. **(Action assigned to George Henckel, BHI).**

2. Dennis Faulk (EPA) requested that well 699-55-60A be added to the well network for 200-ZP-1. **(Action assigned to Joan Woolard, BHI).**

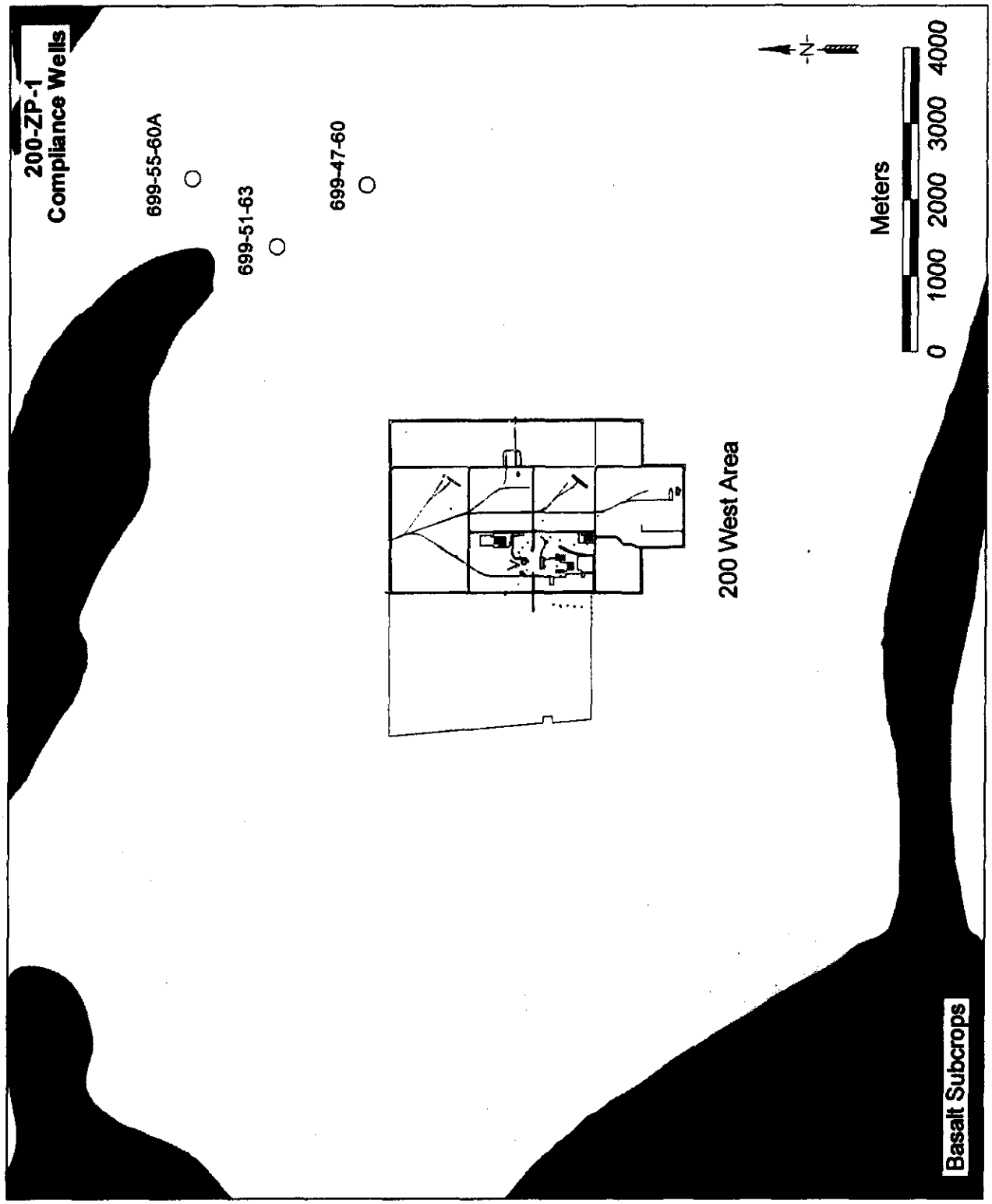
3. A revised agreement form and list of wells on the waste handling issue at 200-ZP-1 and 200-ZP-2 will be provided to Dennis Faulk (EPA) on Friday, April 28, 2000, for his signature. **(Action assigned to Joan Woolard/George Henckel, BHI).**

4. Provide preliminary schedule and cost estimates to EPA on May 15, 2000, for the Partitioning Interwell Tracer Test (PITT) technology for 200-ZP-1 and 200-ZP-2. **(Action assigned to Arlene Tortoso, RL.)**

5. Approve the 200-ZP-2 monitoring plan for FY 2000 on Friday, April 28, 2000. **(Action assigned to Dennis Faulk, EPA.)**

6. Research and provide reason to Dennis Faulk why the results at well W15-217 are drastically lower on 9/28/99 and 3/7/00 regarding the carbon tetrachloride rebound concentrations at the 200-ZP-2 SVE sites. **(Action assigned to Virginia Rohay, CHI.)**

7. Provide information to EPA and Ecology on the annual relook at OU prioritization in support of the FY 2001-2003 Detailed Work Planning. **(Action assigned to Bryan Foley, RL.)**


200-ZP-1
Compliance Wells
699-55-60A
699-51-63
699-47-60
200 West Area
N
Meters
0 1000 2000 3000 4000
Basalt Subcrops

Attachment 5

Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-ZP-2 Soil Vapor Extraction Sites FY 1997 - FY 2000

200-ZP-2 Location (Well or Probe) /feet bgs	Site	Zone	November 1996 - July 1997 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	October 1997 - September 1998 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	July 1998 - September 1999 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound	July 1999 - February 2000 Maximum Rebound Carbon Tetrachloride (ppmv)	months* of rebound
79-03/ 5 ft	Z-18	1	0	8	0	3	0	12		
79-06/ 5 ft	Z-1A	1	not measured		not measured		1.4	12		
79-11/ 5 ft	Z-1A	1	0	8	0	6	2.9	12		
86-05/ 5 ft	Z-9	1	not measured		not measured		0	3		
86-05-01/ 5 ft	Z-9	1	not measured		not measured		0	3		
86-06/ 5 ft	Z-9	1	1.3	8	0	9	1.9	6		
87-05/ 5 ft	Z-1A	1	not measured		0	3	1.0	12		
87-09/ 5 ft	Z-1A	1	not measured		1.5	3	2.6	12		
94-02/ 5 ft	Z-9	1	0	8	not measured		1.4	3		
95-11/ 5 ft	Z-9	1	0	8	2.1	9	2.5	6		
95-12/ 5 ft	Z-9	1	1.1	8	1.5	9	1.3	6		
95-14/ 5 ft	Z-9	1	not measured		not measured		0	3		
CPT-13A/ 9 ft	Z-1A	2	not measured		0	6	1.0	12		
CPT-16/ 10 ft	Z-9	2	not measured		0	9	1.5	6		
CPT-17/ 10 ft	Z-9	2	not measured		4.2	9	5.1	6	3.1	8
CPT-18/ 15 ft	Z-9	2	not measured		6.5	9	5.0	6	4.3	8
CPT-31/25 ft	Z-1A	2	not measured		0	6	0	12		
CPT-16/ 25 ft	Z-9	2	not measured		not measured		not measured		0	8
CPT-32/ 25 ft	Z-1A	2	not measured		9.1	6	10	12	9.4	5
CPT-30/ 28 ft	Z-18	2	not measured		not measured		3.2	12	1.4	5
CPT-13A/ 30 ft	Z-1A	2	2.2	8	not measured		not measured		2.1	5
CPT-7A/ 32 ft	Z-1A	2	not measured		2.3	6	5.4	12	4.4	5
CPT-27/ 33 ft	Z-9	2	1.2	8	not measured		not measured		1.3	8
CPT-1A/ 35 ft	Z-18	2	2.0	8	1.4	3	3.0	12	4.1	5
CPT-33/ 40 ft	Z-1A	2	not measured		2.0	3	2.6	12		
CPT-34/ 40 ft	Z-18	2	2.3	8	not measured		1.7	12		
CPT-21A/ 45 ft	Z-9	2	65.6	8	52.7	9	57	3	82	8
W15-220ST/ 52 ft	Z-9	2	2	8	not measured		1.6	3		
CPT-28/ 60 ft	Z-9	2	not measured		1.5	0	3.7	3		
CPT-9A/ 60 ft	Z-9	2	45.5	8	41.1	0	44	3	44	8
CPT-30/ 68 ft	Z-18	2	1.7	8	not measured		3.0	12		
CPT-13A/ 70 ft	Z-1A	2	5.2	8	not measured		5.6	12		
CPT-24/70 ft	Z-9	2	not measured		3.2	9	3.6	3		
W15-219SST/ 70 ft	Z-9	2	14.6	8	not measured		7.6	3		
CPT-31/ 76 ft	Z-1A	2	4.0	8	not measured		4.2	12		
CPT-33/ 80 ft	Z-1A	2	5.8	8	not measured		9.2	12		
W15-82/ 82 ft	Z-9	2	28.9	8	5.5	9	46	6	43	8
W15-95/ 82 ft	Z-9	2	not measured		15.3	9	39	6	15	8
CPT-21A/ 86 ft	Z-9	2	221	8	206	9	148	6	141	8
CPT-34/ 86 ft	Z-18	2	36.3	8	5.9	3	0	12		
W15-218SST/ 86 ft	Z-9	2	not measured		not measured		0	3		
CPT-28/ 87 ft	Z-9	2	280	8	230	9	203	6	181	8
CPT-1A/ 91 ft	Z-18	2	3.9	8	not measured		4.2	12		
CPT-4A/ 91 ft	Z-1A	2	not measured		7.7	3	14	12		
CPT-9A/ 91 ft	Z-9	2	103	8	34.5	9	72	3		
W18-252SST/ 100 ft	Z-1A	2	38.2	8	17.8	3	24	12		
W18-152/ 113 ft	Z-12	2	46.8	8	11.1	3	33	12	25	5
W15-217/ 115 ft	Z-9	3	797	8	630	9	561	6	400	8
CPT-24/ 118 ft	Z-9	3	44.6	8	37.7	9	37	6		
W15-220SST/ 118 ft	Z-9	4	21.9	8	not measured		36	3		
W18-158L/ 123 ft	Z-1A	3	not measured		143	3	492	12	152	5
W18-167/ 123 ft	Z-1A	3	323	8	79.7	3	228	12	144	5
W15-219SST/ 130 ft	Z-9	4	298	8	not measured		47	3		
W18-249/ 134 ft	Z-18	3	206	8	20.4	3	215	12	173	5
W18-248/ 136 ft	Z-1A	3	288	8	86.3	3	177	12	130	5
W15-219SST/ 155 ft	Z-9	5	59.6	8	not measured		24	3		
W15-220SST/ 185 ft	Z-9	5	14.5	8	not measured		13	3		
W15-6L/ 189 ft	Z-9	6	22.6	8	17.8	9	1.3	6		
W15-9L/ 189 ft	Z-9	6	18.3	8	15.0	9	15	6	14	8
W18-7/ 200 ft	Z-1A	6	28.5	8	17.3	3	29	12		
W18-6L/ 208 ft	Z-1A	6	36	8	31.3	6	15	12		
W18-12/ 210 ft	Z-18	6	not measured		3.8	3	19	12		

* - based on location (Z-1A/18/12 or Z-9) of monitoring point; specific points may be beyond SVE zone of influence during particular operating configurations

- Z-18 and Z-12 wells off-line Oct 96 - Apr 98
- CPT-1A, CPT-9A, and possibly CPT-7A appeared to be beyond SVE zone of influence in Oct 96 based on differential pressure (BHI-01105, p. 6-1)
- CPT-9A, CPT-21A, CPT-28 beyond SVE zone of influence in May 96 based on CCl4 concentrations and airflow modeling based on measured vacuums (BHI-01105, p. 6-1)

Carbon Tetrachloride Rebound Concentrations
Monitored at 200-ZP-2 Soil Vapor Extraction Sites
July 1999 - February 2000

200-ZP-2										
Location			07/30/99	09/14/99	9/28/99	10/26/99	11/30/99	12/29/99	01/25/00	03/07/00
(Well or Probe)	Site	Zone								
/feet bgs			CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4	CCl4
			(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)
CPT-17/ 10 ft	Z-9	2	2.1	2.6	2.3	1.7	3.1	2.6	2.9	1.7
CPT-18/ 15 ft	Z-9	2	1.3	3.5	0	1.8	1.6	4.3	2.8	2.6
CPT-16/ 25 ft	Z-9	2				0	0	0	0	0
CPT-32/ 25 ft	Z-1A	2				0	0	1.5	3.8	9.4
CPT-30/ 28 ft	Z-1A	2				0	1.0	1.4	0	0
CPT-13A/ 30 ft	Z-1A	2				0	0	1.6	1.1	2.1
CPT-7A/ 32 ft	Z-1A	2				2.3	1.9	2.8	2.3	4.4
CPT-27/ 33 ft	Z-9	2				1.1	0	1.2	1.2	1.3
CPT-1A/ 35 ft	Z-12	2				2.5	3.1	2.8	4.1	3.3
CPT-21A/ 45 ft	Z-9	2	51.7	56.6	42	50.3	78	70.4	81.6	54.0
CPT-9A/ 60 ft	Z-9	2	----- (a)	43.9	44.0	32.9	39.3	43.5	38.1	33.2
W15-82/ 82 ft	Z-9	2	----- (a)	42.5	38.1	35.7	23.4	21.2	19.0	29.8
W15-95/ 82 ft	Z-9	2	----- (a)	8.3	7.6	9.0	11.2	12.0	14.5	13.2
CPT-21A/ 86 ft	Z-9	2	66.6	12.6	123	90.7	133	123	141	113
CPT-28/ 87 ft	Z-9	2	49.3	151	105	104	170	180	181	69.7
W18-152/ 113 ft	Z-12	2				1.8	22.1	24.7	17.7	3.7
W15-217/ 115 ft	Z-9	3	68.6	267	26.3	204	317	370	400	92.0
W18-158L/ 123 ft	Z-1A	3				79.6	103	134	132	152
W18-167/ 123 ft	Z-1A	3				88.8	115	144	109	104
W18-249/ 134 ft	Z-18	3				74.8	132	173	149	60.0
W18-248/ 136 ft	Z-1A	3				130	96.7	85.5	110	130
W15-9L/ 189 ft	Z-9	6	----- (a)	10.3	1.1	8.6	12.0	12.1	14.4	9.0
(a) sample pump failure										

Results of 200-CW-1 Drum Sampling for Hydrazine

Drum Number	Package Date	Depth Interval (ft)	Waste Description	Samples Collected	Sample Number	Concentration	Units
600A-99-0006	9/14/1999	0-8	Soil	1	B0Y0N8	1.0 U	mg/kg
600A-99-0007	9/14/1999	8-10.5	Soil	1	B0Y0N9	0.90 U	mg/kg
600A-99-0007	9/14/1999	8-10.5	Soil	1 co-located duplicate for QC purposes	B0Y0P4	1.1 U	mg/kg
600A-99-0008	9/14/1999	10.5-16	Soil	1	B0Y0P0	0.87 U	mg/kg
600A-99-0009	9/15/1999	16-20	Soil	1	B0Y0P1	0.72 U	mg/kg
600A-99-0010	9/15/1999	20-24.5	Soil	1	B0Y0P2	0.79 U	mg/kg
600A-99-0011	9/15/1999	24.5-28	Soil	1	B0Y0P3	1.1 U	mg/kg
600A-99-0040	10/1/1999	NA	Groundwater	1	B0Y0P8	0.10 U	mg/L

APPROVAL OF THE 200-ZP-2 MONITORING PLAN FOR FY 2000

The Unit Managers for the 200-ZP-2 Operable Unit approve the attached FY 2000 Vadose Zone Monitoring Plan for 200-ZP-2.

Arlene C. Tortoso 4/27/00

A. C. Tortoso Date
U.S. Department of Energy
Richland Operations Office

D. A. Faulk 4-28-00

D. A. Faulk Date
U. S. Environmental Protection Agency
Region X, Hanford Office

VADOSE ZONE MONITORING PLAN FOR 200-ZP-2 FOR FY 2000
OCTOBER 1999 THROUGH SEPTEMBER 2000

Non-Operational Monitoring and Passive Soil Vapor Extraction Monitoring

This plan describes the non-operational monitoring and passive soil vapor extraction monitoring to be conducted during Fiscal Year 2000 implementation of the expedited response action for 200 West Area Carbon Tetrachloride Plume (EPA 1992).

Scope: Monitor carbon tetrachloride soil vapor concentrations at selected probes and wells during the shutdown of the soil vapor extraction (SVE) system (Tables 1 and 2). All of the probes and some of the wells are "non-operational," i.e., they are not currently connected to a SVE system. Eight of the wells have a passive soil vapor extraction system installed at the wellhead.

Passive soil vapor extraction is a remediation technology that uses naturally-induced pressure gradients between the subsurface and the surface to drive soil vapor to the surface. In general, falling atmospheric pressure causes subsurface vapor to move to the atmosphere through wells, while rising atmospheric pressure causes atmospheric air to move into the subsurface. The passive soil vapor extraction systems will be used to remove carbon tetrachloride from the vadose zone.

All of the passive extraction wells will vent through above-ground canisters containing Granular Activated Carbon (GAC). Each system also has an in-line, replaceable cartridge of GAC for sampling upstream of the canister of GAC. The GAC cartridges will be sampled and analyzed periodically to provide a passive, time-integrated measure of the amount of mass removed through the well. Three of the passive systems are also instrumented to measure and record the flow and carbon tetrachloride vapor concentration on an hourly basis; these data can be used to calculate an hourly estimate of the amount of mass removed (Table 3).

For monitoring the non-operational probes and wells, the components of this scope are:

- Collect soil vapor samples using the rebound study sampling method and sampling pump (Rohay 1997)
- Analyze soil vapor samples for carbon tetrachloride using B&K at field screening level QC-1 (BHI-QA-03)
- Evaluate concentration trends for ERC
- Report results to 200-ZP-2 Unit Managers
- Include results in annual reports

For monitoring the 8 passive soil vapor extraction system wells, the components of this scope are:

- Changeout the used in-line GAC sample cartridges and replace with clean GAC sample cartridges

- Sample the GAC and send the GAC samples to an off-site laboratory for analysis of carbon tetrachloride (Sampling Authorization Form B99-093)
- Download the dataloggers (4) and B&K instruments (3)
- Evaluate concentration trends for ERC
- Report results to 200-ZP-2 Unit Managers
- Include results in annual reports

Purpose and Objectives: The purpose of non-operational monitoring is to measure carbon tetrachloride concentrations in the vadose zone during the shutdown of the SVE system.

The objectives of monitoring the non-operational wells and probes are (1) to be cognizant of carbon tetrachloride concentrations and trends near the vadose-atmosphere and vadose-groundwater interfaces to ensure that non-operation of the SVE system is not negatively impacting atmosphere or groundwater; and (2) to be cognizant of carbon tetrachloride concentrations and trends near the lower permeability Plio-Pleistocene layer to provide an indication of concentrations that can be expected during restart of SVE operations and to support selection of on-line wells.

The objectives of monitoring the passive soil vapor extraction system wells, which are all open near the vadose-groundwater interface, are (1) to be cognizant of the carbon tetrachloride concentrations and trends near the vadose-groundwater interface; and (2) to quantify the mass of carbon tetrachloride removed using this technology. The instrumented systems will be operated to provide a long-term record of passive extraction data, particularly contaminant concentrations in the extracted vapor and mass removal rates.

Duration: Non-operational monitoring and passive soil vapor extraction monitoring will be conducted from October 1999 through September 2000 during FY 2000. It is anticipated that the non-operational and passive extraction monitoring will be continued in FY 2001 through March 2001.

Monitoring Frequency: Monitoring will be conducted monthly. It is assumed that (1) the ERC sampler(s)/geologist will spend approximately 2 days/month collecting and analyzing samples, shipping passive GAC samples to offsite laboratories, and downloading data; and (2) the ERC technical lead will spend approximately 1 day/month analyzing and reporting the results.

Monitoring Locations: Locations were selected to focus carbon tetrachloride monitoring near the vadose-atmosphere and vadose-groundwater interfaces and near the Plio-Pleistocene layer (Table 1). At the recommendation of the ERC technical lead, and with approval from the ERC task lead, these monitoring locations could be revised based on developing trends, accessibility, and/or recommendations of the sampler. The 200-ZP-2 Unit Managers will be advised of any changes to the monitoring locations. Monitoring locations are shown on Figure 1.

Note: During FY97, FY98, and FY99, carbon tetrachloride concentrations and trends were also monitored at shallow soil vapor probes (1.5 m deep). In light of the sporadic and low

concentrations detected at these shallow soil vapor probes, shallow monitoring was not included in this plan for FY2000.

Data Management: The field screening data obtained from non-operational wells and probes are entered into a controlled field logbook, which is maintained by ERC Document & Information Services. The ERC technical lead organizes and maintains spreadsheets of the field screening data on a desk-top computer. The field screening data are included in the annual performance evaluation report.

The laboratory data obtained from the GAC samples on the 8 passive extraction wells will be entered into HEIS. A hardcopy of the data and associated paperwork will be maintained by ERC until transmitted to Hanford records holding. The data collected from the dataloggers and B&Ks are stored on ERC network drives that are backed up daily. The ERC technical lead organizes and maintains spreadsheets of all the passive extraction data on a desk-top computer. The passive extraction data will be included in the annual performance evaluation report.

References:

BHI-QA-03, ERC Quality Assurance Program Plans, Procedure 5.2, Onsite Measurements Quality Assurance Program Plan

BHI-01105: Rohay, V.J., 1997, Rebound Study Report for the Carbon Tetrachloride Soil Vapor Extraction Site, Fiscal Year 1997, BHI-01105, Rev. 0

EPA, 1992, Action Memorandum: Expedited Response Action Proposal for 200 West Area Carbon Tetrachloride Plume

Table 1. Distribution of Selected Monitoring Locations

Target Zone	Number of Monitoring Locations		
	Z-1A	Z-9	Total
Near-surface (3-20 m below ground surface)	5	6	11
Plio-Pleistocene (25-45 m below ground surface)	5	5	10
Groundwater (50-65 m below ground surface)	8[a]	1	9
Total	18	12	30

[a] Eight available monitoring locations near the vadose/groundwater interface in the Z-1A area are being monitored as part of the passive soil vapor extraction system network. The passive network also includes an additional 12 wells and probes that are monitored only for pressures (Table 3).

Table 2. Wells and Probes Selected for Non-Operational Monitoring and Passive Soil Vapor Extraction Monitoring

Target Zone	Z-9	Depth (m)	Comment	Z-1A	Depth (m)	Comment
near-surface	CPT-17 10 ft (blue)	3	southwest of Z-9	CPT-32 25 ft (green)	8	west of Z-1A
near-surface	CPT-18 15 ft (white)	5	northwest of Z-9	CPT-30 28 ft (green)	9	north of Z-18 (middle of Z-1A/Z-18/Z-12 field)
near-surface	CPT-16 25 ft (blue)	8	east of Z-9	CPT-13A 30 ft (blue)	10	southeast of Z-1A
near-surface	CPT-27 33 ft (red)	10	southeast of Z-9	CPT-7A 32 ft (yellow)	10	farfield northeast of Z-1A
near-surface	CPT-21A 45 ft (green)	14	south of Z-9	CPT-1A 35 ft (black)	11	west of Z-12
near-surface	CPT-9A 60 ft (blue)	18	farfield north of Z-9			
Plio-Pleisto	W15-82	25	east side of Z-9	W18-152	34	northwest corner of Z-12
Plio-Pleisto	W15-95	25	north side of Z-9	W18-158L	37	within Z-1A
Plio-Pleisto	CPT-21A 86 ft (red)	26	south of Z-9	W18-167	37	within Z-1A
Plio-Pleisto	CPT-28 87 ft (red)	27	farfield south of Z-9	W18-249	41	northeast corner of Z-18
Plio-Pleisto	W15-217	35	southwest corner of Z-9	W18-248	41	east side of Z-1A
Gw	W15-9L	57	north of Z-9, 11 m from W15-32 extraction well	W18-6L*	60	west side of Z-1A
Gw				W18-7*	57	east side of Z-1A
Gw				W18-10L*	55	east side of Z-18
Gw				W18-11L*	60	Z-18
Gw				W18-12*	60	Z-18
Gw				W18-246L*	52	west of Z-1A
Gw				W18-247L*	51	southeast of Z-18
Gw				W18-252L*	53	west of Z-1A (middle of Z-1A/Z-18/Z-12 field)

* Passive soil vapor extraction wells (Table 3)

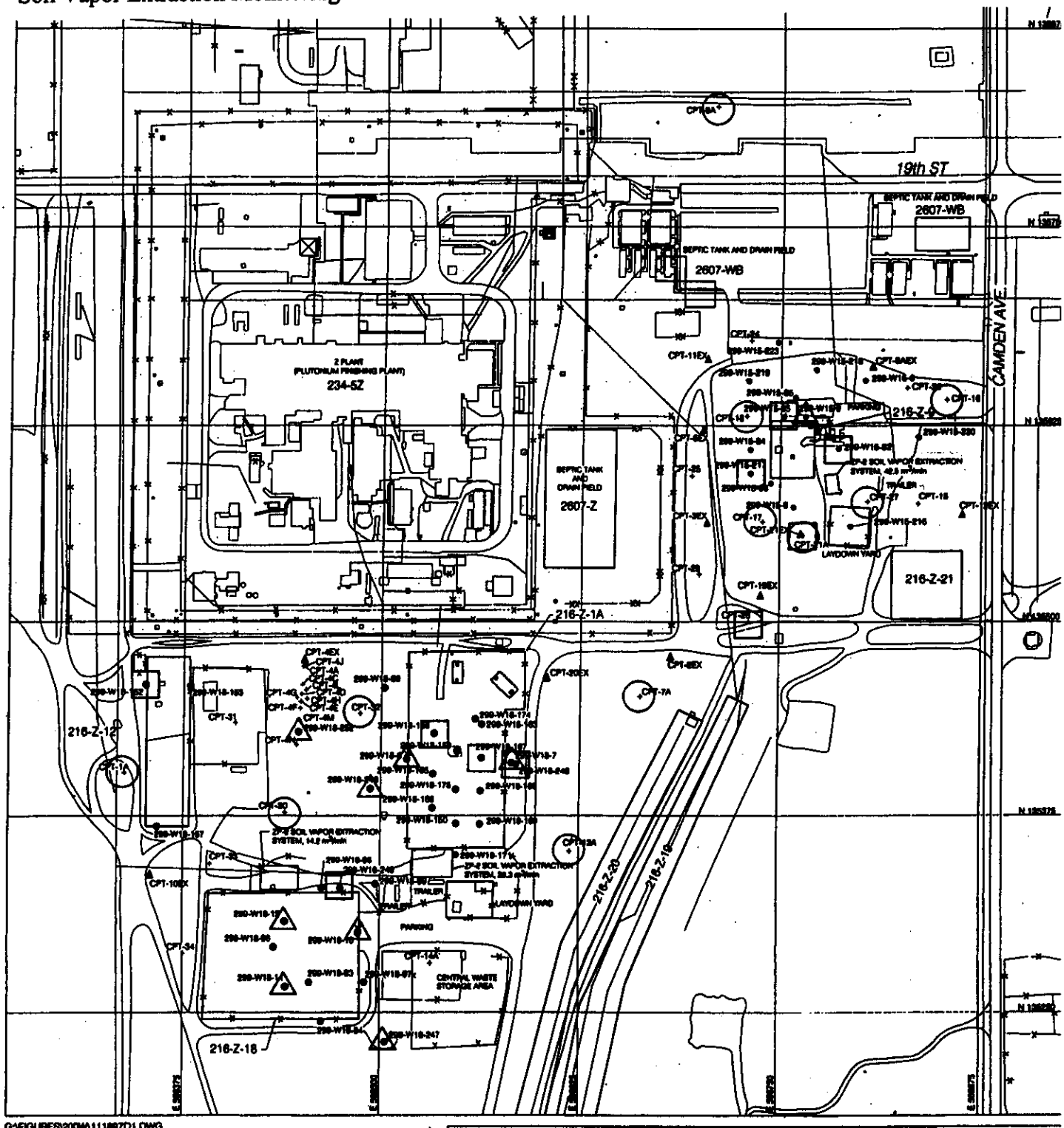
Note: Colors refer to the color coding on the soil vapor probe tubing.

Table 3. Passive Soil Vapor Extraction Well Network

Well/Probe	Purpose	Instrumentation Parameter	Comment	Open Interval (m bgs)
299-W18-7	Extraction	Carbon Tetrachloride (GAC)		51 – 62
299-W18-6U	Monitoring	Differential Pressure	Sealed well	29 – 38
299-W18-6L	Extraction	Differential Pressure	two 60-m lengths of sample tubing dropped in well	58 – 61
		Airflow		
		Temperatures at 3 m, 60 m below top of well		
		Carbon Tetrachloride (B&K)		
		Carbon Tetrachloride (GAC)		
299-W18-9	Monitoring	Differential pressure	Sealed well	55 – 64
		Temperatures at 3 m, 60 m below top of well		
299-W18-10L	Extraction	Carbon Tetrachloride (GAC)		45 – 64
299-W18-11L	Extraction	Carbon Tetrachloride (GAC)		55 – 65
299-W18-12	Extraction	Carbon Tetrachloride (GAC)		54 – 65
299-W18-246L	Extraction	Carbon Tetrachloride (GAC)		50 – 53
299-W18-247L	Extraction	Differential pressure	Well with long passive extraction record	49 – 52
		Airflow		
		Temperatures at 3 m, 60 m below top of well		
		Carbon Tetrachloride (B&K)		
		Carbon Tetrachloride (GAC)		
299-W18-247U	Monitoring	Differential pressure	Sealed well	36 – 39
299-W18-252L	Extraction	Differential pressure		50 – 56
		Airflow		
		Temperatures at 3 m, 60 m below top of well		
		Carbon Tetrachloride (B&K)		
		Carbon Tetrachloride (GAC)		
		Barometric pressure		
299-W18-252U	Monitoring	Differential pressure	Sealed well	34 – 41
299-W18-252/SST100 (red)	Monitoring	Differential pressure	Stainless steel tubes strapped to outside of casing	30
299-W18-252/SST145 (blue)	Monitoring	Differential pressure		44
299-W18-252/SST210 (yellow)	Monitoring	Differential pressure		64
CPT-4F/10 (black)	Monitoring	Differential pressure	Soil probes emplaced using cone penetrometer	3
CPT-4F/25 (white)	Monitoring	Differential pressure		8
CPT-4F/50 (blue)	Monitoring	Differential pressure		15
CPT-4F/75 (yellow)	Monitoring	Differential pressure		23
CPT-4F/109 (red)	Monitoring	Differential pressure		33

Note: Colors refer to the color coding on the soil vapor probe tubing.

Figure 1. Location of Wells and Probes Selected for Non-Operational Monitoring and Passive Soil Vapor Extraction Monitoring



LEGEND

- NEAR SURFACE (3 to 20 m below ground surface)
- PLIO-PLEISTOCENE (25 to 45 m bgs)
- GROUNDWATER (50-65 m bgs)
- + CPT-35 — CONE PENETROMETER SOIL VAPOR PROBE LOCATION AND NUMBER DESIGNATION
- ▲ CPT-4EX — CONE PENETROMETER SOIL VAPOR EXTRACTION WELL LOCATION AND NUMBER DESIGNATION
- ● 299-W15-82 — 200-ZP-2 SOIL VAPOR EXTRACTION/MONITORING WELL LOCATION AND NUMBER DESIGNATION
- 216-Z-18 — LIQUID WASTE DISPOSAL SITE

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